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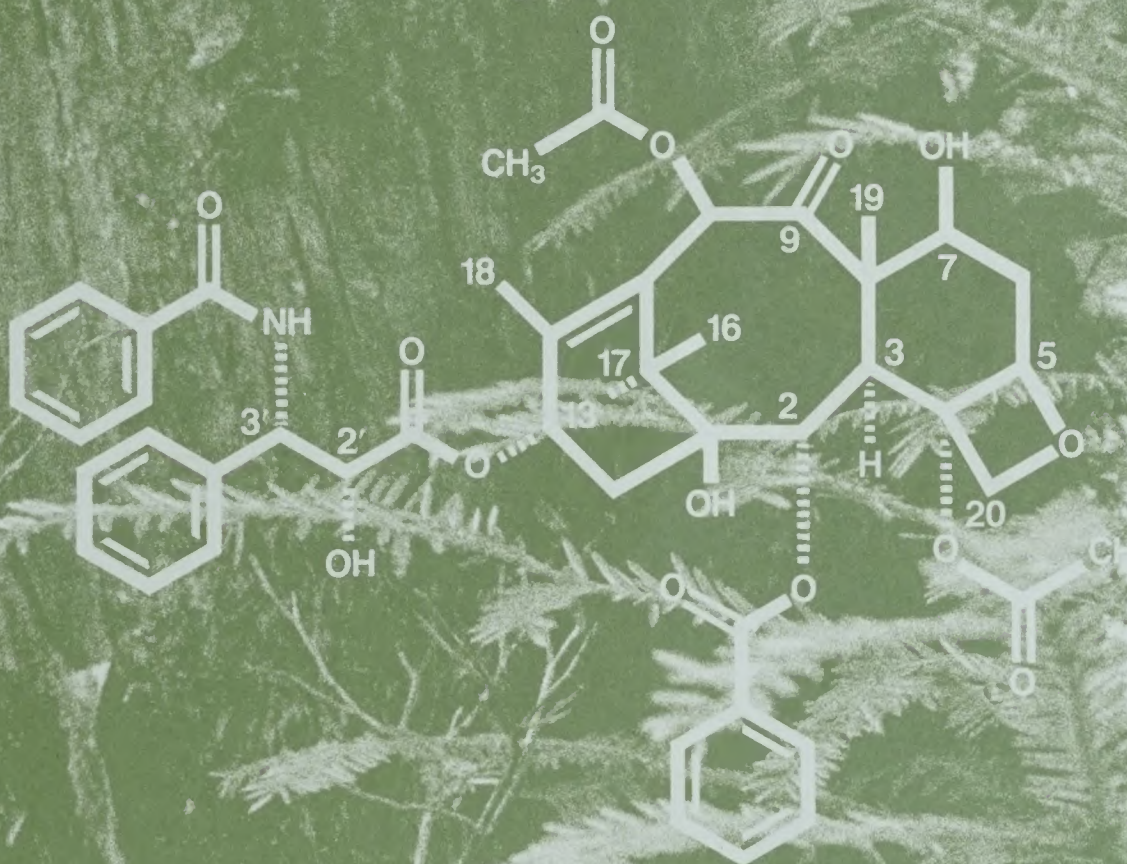


Pacific Yew

Final Environmental Impact Statement

September, 1993 ☐

Record of Decision



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Record of Decision

USDA Forest Service and
Bureau of Land Management

Pacific Yew
Final Environmental Impact Statement
August 1993

USDA Forest Service
USDI Bureau of Land Management
National Forests and BLM Districts in
Washington, Oregon, California, Idaho, and Montana
USDHHS Food and Drug Administration

Record of Decision

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Acronyms to Know

BLM	<i>Bureau of Land Management</i>
BMS	<i>Bristol-Myers Squibb Company</i>
CEQ	<i>Council on Environmental Quality</i>
CRADA	<i>Cooperative Research and Development Agreement</i>
DEIS	<i>Draft Environmental Impact Statement</i>
FDA	<i>Food and Drug Administration</i>
FEIS	<i>Final Environmental Impact Statement</i>
INDA	<i>Investigational New Drug Application</i>
MOU	<i>Memorandum of Understanding</i>
NCI	<i>National Cancer Institute</i>
NDA	<i>New Drug Application</i>
ROD	<i>Record of Decision</i>
USDA	<i>United States Department of Agriculture</i>
USDHHS	<i>United States Department of Health and Human Services</i>
USDI	<i>United States Department of the Interior</i>

I. Introduction

The Final Environmental Impact Statement (FEIS) documents the results of the environmental analysis of harvest alternatives for Pacific yew (*Taxus brevifolia*) on National Forest System lands and lands administered by the Bureau of Land Management (BLM) in Oregon, Washington, Idaho, Montana, and California. We have read the FEIS and reviewed related materials, including responses to the Draft Environmental Impact Statement (DEIS) published in January 1993. We have also considered the current situation concerning demand for Pacific yew from federal lands. Our decision is based upon all of these items and this Record of Decision (ROD) documents our reasons for adopting Alternative B of the FEIS. Our decision applies to both National Forest System lands and lands administered by the Bureau of Land Management.

A. Background

Pacific yew is a small, evergreen tree found in forests throughout the northwest, from southeast Alaska to northern California, as well as in parts of Idaho and Montana. Although rarely found in pure stands, the Pacific yew is not an endangered or threatened species. Inventories for Pacific yew in eight national forests and six BLM districts in Oregon, Washington, and Idaho found over 50 million yew trees over one inch in diameter at breast height.

In the 1960's and 1970's, the National Cancer Institute (NCI) extracted taxol¹ from Pacific yew samples and found that it had anti-cancer activity. During this time, researchers succeeded in defining the structure of the taxol molecule, its mechanism of action, and its activity against cancer cells in various animal systems. In 1982, the NCI filed an Investigational New Drug Application (INDA) with the Food and Drug Administration (FDA) and began clinical trials using taxol extracted from Pacific yew bark. The clinical trials showed that taxol was very effective against a number of cancers, and in the late 1980's, NCI contracted to have yew bark collected from National Forest System lands; approximately 132,000 pounds were collected. NCI then began a search for a pharmaceutical partner who could develop the drug, find a reliable taxol source, and bring it to market; after a competitive process, the Bristol-Myers Squibb Company (BMS) was selected and a Cooperative Research and Development Agreement (CRADA) between BMS and NCI was completed.

In 1991, the Departments of Agriculture, Interior, and Health and Human Services signed a Memorandum of Understanding (MOU) to coordinate activities and assist BMS in obtaining raw material (yew bark) needed to produce taxol in accordance with the CRADA. Based on the MOU, the Forest Service and BLM each entered into a cooperative agreement with BMS to supply it with Pacific yew for taxol production. In 1991 and 1992, about 1.7 million dry pounds of yew bark were harvested from federal lands for BMS.

In August of 1992, the Pacific Yew Act (PL 102-335 106 Stat. 859) was passed by Congress and signed into law. The Act ensures that

¹ Taxol is now a registered trademarked name (Taxol®); however, in this document we use the word taxol in a generic sense, referring to the drug paclitaxel (taxol) and related taxanes that are present in Pacific yew.

the Forest Service and BLM carry out efficient collection and utilization of Pacific yew for taxol; specifies the conditions of sale of Pacific yew from federal lands; ensures long-term conservation of Pacific yew; and prevents waste of Pacific yew resources.

As part of the CRADA with NCI, BMS is obligated to investigate and establish alternative sources of taxol and file for approval of New Drug Applications (NDA) for taxol. In December, 1992, the FDA approved the NDA filed by BMS which allows BMS to commercially market taxol, derived from Pacific yew bark, for treatment of ovarian cancer. One month later, in January of 1993, BMS announced that, as a result of their progress with alternative approaches, they did not need Pacific yew bark from federal lands in 1993. Although BMS purchased bark from federal lands in 1993 to fulfill past obligations and assist the Forest Service and BLM in complying with the Pacific Yew Act (which requires pre-harvest of yew in timber sales), it will most likely not be purchasing yew material from federal lands after the 1993 yew harvest season.

Over the last two years, several other parties have requested federal yew for the purposes of taxol research or development. However, less than 10,000 pounds have been transferred since 1991 for these purposes.

B. Scope of the Decision

The scope of this decision applies to harvest of Pacific yew for taxol while there is a valid demand for Pacific yew biomass for use in research and treatment of cancer. This decision will be implemented only when there is a demand for Pacific yew from federal lands for taxol. It provides a strategy for harvesting Pacific yew for the next five years (1993-1997) on National Forest System lands and lands administered by the BLM.

This decision provides the framework, as well as some specific guidelines and mitigation measures, for Pacific yew harvest on federal lands. It does not specify exact locations of yew harvest, exact numbers of yew for harvest in any one location, or the particular environmental risks for each acre where yew is present. Site-specific environmental analyses are required before any yew

harvest takes place; these analyses will be tiered to the FEIS. Conservation measures for listed, threatened, and endangered species that are developed during site-specific (project level) consultation required by the Endangered Species Act may be more restrictive than, and will take precedence over, the measures described in the FEIS and ROD. To the extent that the standards and guidelines of future agency resource plans conflict with this Record of Decision, the direction contained in the agency plans will be pre-eminent.

This decision also does not analyze or propose alternatives for the short- or long-term *management* of Pacific yew. Management of Pacific yew is an issue that will be addressed in agency resource plans and policies. This decision also does not analyze or propose solutions for other issues, such as theft of Pacific yew, the relationship prescribed by the CRADA between NCI and Bristol-Myers Squibb, or the development of other sources of taxol.

If, *within* the five years covered by this ROD, the demand for yew from National Forest System and BLM lands exceeds the amount that can be supplied by this decision, the need for a new decision will be examined. If, *after* the five years covered by this ROD, there is still a demand for Pacific yew from federal lands for taxol, this analysis will be reviewed, and a new or supplementary EIS will be prepared if necessary. In order to continue yew harvest beyond five years, a new decision would be necessary.

C. Public Involvement

In the early phase of the environmental impact analysis, citizens, interest groups, businesses, and state, county, and other federal agencies helped us identify the important issues. The EIS interdisciplinary team contacted the public by newsletter and in meetings to gather the issues and concerns that should be addressed in the analysis. The team met with various groups and kept in touch with key contacts. The issues suggested by the public were used to guide the development of the EIS.

Detailed information describing the public involvement process is presented in Appendix A of the DEIS and FEIS.

Initial Issues and Concerns: Most people who responded wanted the Forest Service and BLM to harvest yew for the production of taxol but, at the same time, protect the Pacific yew species and its environment. Three main issues were identified:

Protect and maintain the Pacific yew species (establish reserve areas or numbers of reserve trees).

Protect the ecosystem (riparian areas, wildlife, other plants, soil, fire cycles, old growth forests).

Provide material from the Pacific yew for taxol.

A number of suggestions were made that related to the above issues. These included:

Establish a sustainable level of collection and analyze the impacts of harvesting minimum to maximum amounts.

Consider social, cultural, and tribal impacts of collecting yew.

Regenerate yew by planting yew and managing for natural regeneration.

Consider the economic impacts of yew collection on timber production, local employment, and a long-term local yew collection industry; look at future supplies of taxol and other possible drugs and agreements for taxol production.

Establish areas of collection and decide whether or not to enter set-aside areas such as wilderness, spotted owl habitat, Research Natural Areas, and roadless areas; decide whether or not to build new roads for access; and concentrate collection in certain areas or spread collection over wide areas.

Establish collection methods; consider partial bark stripping, tree felling, and collection of needles and twigs.

Utilize the yew completely, including all the bark, twigs, needles, and wood.

Develop other sources of taxol as soon as possible.

Stop theft and illegal harvest.

DEIS Comment Period And Comment Analysis: The Federal Register published the notice of availability for the DEIS on January 22, 1993. The public review period of 45 days ended March 15, 1993. Eighty-eight comments were received on the DEIS. This small number of responses may reflect the announcement by BMS on January 25, 1993, that it would no longer need bark from Pacific yew on federal lands.

What follows are the major concerns expressed by the public following the release of the DEIS.

- Restate the DEIS purpose and need; consider new alternatives; prepare a supplement to the DEIS.
- Create a needle harvest alternative.
- Provide for sustained yield of yew.
- Protect the Pacific yew tree; continue inventory and research efforts; and re-establish yew in previously harvested areas.
- Protect the whole ecosystem.

II. The Decision

It is our decision to select Alternative B as the Pacific yew harvest strategy for the National Forest System lands and lands administered by the Bureau of Land Management in Washington, Oregon, California, Idaho and Montana for the next five years (1993-1997). Our selection of Alternative B is based on the analysis in the FEIS, consideration of public comments on the DEIS, and a significant reduction in demand for yew from federal lands for taxol production.

Alternative B permits harvest of any part of the Pacific yew for taxol production from timber sale units and where it might otherwise be destroyed. For the purpose of this document, timber sale units are defined as any area within a timber sale which has a silvicultural prescription for a clearcut², shelterwood², or seed tree² harvest method. Pacific yew may also be harvested for taxol from other areas where the yew would otherwise be destroyed by such activities as other timber harvesting, road building or other construction, a prescribed fire treatment, or similar activities. Site-specific environmental analyses are required before any yew harvest takes place.

We recognize that other parts of the yew, such as seed or scion material, may be needed for research or propagation purposes. This decision permits non-destructive harvest (where tree or shrub is not killed) of small quantities of such material for these purposes in any area where allowed by forest plans, BLM resource management plans (draft or final), or new agency resource plans.

Under this alternative, 258,000 to 386,000 pounds of dry bark and/or 686,000 to 1,030,000 pounds of dry needles from an estimated 52,000 to 78,000 yew would be available each year for harvest from National Forest System and BLM lands. These estimates are based on the number of yew per acre found in the 1992 Pacific yew inventory and the projected number of acres for timber sales described in forest plans and adjusted according to the FEIS for Management for the Northern Spotted Owl in National Forests (for Forest Service) or in draft resource manage-

² Harvest method terminology may change. These terms may be replaced with their equivalents using ecosystem management or other terminology.

ment plans (for BLM). Many other decisions are currently being made that will most likely reduce the number of timber sale acres and therefore reduce the number of available yew trees and pounds of bark and needles. Under Alternative B, the production of yew from federal lands is largely dependent on the timber harvest program.

Alternative B provides for protection of some of the yew remaining after yew harvest; every sale unit would be regenerated to preharvest or prescribed levels. Special genetic reserves would not be established; however, all acres not committed to timber sales, as defined above, would function as genetic reservoirs.

In summary, Alternative B emphasizes utilization of Pacific yew where it would otherwise be wasted. Production of yew would be dependent on the Forest Service and BLM timber harvest programs. It affords the highest degree of protection to the yew by virtue of allowing the lowest level of harvest (with the exception of Alternative A). It meets the underlying need of the proposed action - to provide Pacific yew for taxol - within the requirements of the Pacific Yew Act.

III. Alternatives

Seven alternatives were fully developed for consideration in this analysis. The alternatives were formulated by the EIS interdisciplinary team using an issue-driven process designed to address concerns raised by employees and the public. The seven alternatives were presented in the DEIS issued in January 1993. The following is a brief description of each of those alternatives. Other alternatives were considered but were not developed in the analysis process; a discussion of these alternatives is included in Chapter II of the FEIS.

A. Alternatives Considered in Detail

Alternative A (No Action): This alternative does not provide any Pacific yew for taxol from federal lands. Pacific yew would be managed as it was before yew was in demand for taxol production. No yew harvest for taxol would take place anywhere on federal lands. There would be no special protection given to it, other than that specified in forest or resource management plans. There would be no special requirements to regenerate Pacific yew after any project or to maintain its genetic diversity, other than that required by current laws and forest and resource management plans.

This alternative gives no particular emphasis to Pacific yew harvest for taxol; it emphasizes all resources according to forest and resource management plans. It would not meet the underlying need for the proposed action (harvesting yew from federal lands for taxol) and it also would not meet the requirements of the Pacific Yew Act.

This alternative meets the CEQ's requirement for a "no-action" alternative in environmental impact statements.

Alternative B: see description of Alternative B in "The Decision" section, above. This alternative is identified as the Preferred Alternative in the FEIS.

Alternative C: Alternative C allows Pacific yew to be harvested in timber sale units and at a 25% level in partial-cut and non-sale areas. In timber sale units, 100% of utilizable-sized yew (excluding green tree reserve) could be harvested; in partial-cut and non-sale areas, up to 25% of the yew in each of three diameter classes could be harvested, leaving at least 75% of the yew or five yew trees per acre (whichever is greater) in each diameter class. An estimated 302,000 to 454,000 yew would be available each year from National Forest System and BLM lands, yielding 1.1 to 1.7 million pounds of dry yew bark and/or 1.8 to 4.5 million pounds of dry needles per year. Yew would be regenerated to preharvest or prescribed levels in timber sale units. Genetic reserve areas would be established whenever yew was harvested outside of timber sales.

This alternative emphasizes a high degree of protection of Pacific yew and the ecosystem in yew harvest areas; it allows a relatively low level of harvest.

Alternative D: Alternative D allows the Pacific yew to be harvested in timber sale units and at a 50% level in partial-cut and non-sale areas. In timber sale units, 100% of utilizable-sized yew (excluding green tree reserve) could be harvested; in partial-cut and non-sale areas, up to 50% of the yew in each of three diameter classes could be harvested, leaving at least 50% of the yew or five yew trees per acre (whichever is greater) in each diameter class. An estimated 526,000 to 788,000 yew would be available each year from National Forest System and BLM lands, yielding 1.9 to 2.8 million pounds of dry yew bark and/or 2.9 to 7.5 million pounds of dry needles per year. Yew would be regenerated to preharvest or prescribed levels in timber sale units. Genetic reserve areas would be established whenever yew was harvested outside of timber sales.

This alternative emphasizes a high degree of protection of Pacific yew and the ecosystem in yew harvest areas while harvesting at a moderate level.

Alternative F: Alternative F allows Pacific yew to be harvested in timber sale units and at a 75% level in partial-cut and non-sale areas. In timber sale units, 100% of utilizable-sized yew (excluding green tree reserve) could be harvested; in partial-cut and non-sale areas, up to 75% of the yew in each of three diameter classes could be harvested, leaving at least 25% of the yew or two yew trees per acre (whichever is greater) in each diameter class. An estimated 846,000 to 1,270,000 yew would be available each year from National Forest System and BLM lands, yielding 3.2 to 4.8 million pounds of dry yew bark and/or 4.6 to 12.7 million pounds of dry needles per year. Yew would be regenerated to preharvest or prescribed levels in timber sale units. Genetic reserve areas would be established whenever yew was harvested outside of timber sales.

This alternative emphasizes high levels of harvest with moderate protection of Pacific yew and the ecosystem in yew harvest areas.

Alternative G1: Alternative G1 allows Pacific yew to be harvested in timber sale units and at a 50% level, leaving a minimum of one yew per diameter class, in partial-cut and non-sale areas. In timber sale units, 100% of utilizable-sized yew (excluding green tree reserve) could be harvested; in partial-cut and non-sale areas, up to 50% of the yew in each of three diameter classes could be harvested, leaving at least 50% of the yew or *one yew tree* per acre (whichever is greater) in each diameter class. An estimated 628,000 to 942,000 yew would be available each year from National Forest System and BLM lands, yielding 3.1 to 4.6 million pounds of dry yew bark and/or 4.4 to 12.3 million pounds of dry needles per year. Yew would be regenerated to preharvest or prescribed levels in timber sale units. Genetic reserve areas would be established whenever yew was harvested outside of timber sales.

This alternative emphasizes efficiency of yew sale preparation and moderate to high production, with moderate protection of yew and the ecosystem in yew harvest areas.

This alternative was identified as the preferred alternative in the DEIS.

Alternative G2: Alternative G2 allows Pacific yew to be harvested in owl conservation areas³ as well as in timber sale units and at a 50% level, leaving a minimum of one yew per diameter class, in partial-cut and non-sale areas. In timber sale units, 100% of utilizable-sized yew (excluding green tree reserve) could be harvested; in owl conservation areas, up to 50% of the yew in each of three diameter classes could be harvested, leaving at least 50% of the yew or *five yew trees per acre* (whichever is greater) in each diameter class: in partial-cut and non-sale areas, up to 50% of the yew in each of three diameter classes could be harvested, leaving at least 50% of the yew or *one yew tree per acre* (whichever is greater) in each diameter class. An estimated 844,000 to 1,266,000 yew would be available each year from National Forest System and BLM lands, yielding 3.8 to 5.7 million pounds of dry yew bark and/or 5.4 to 15.1 million pounds of dry needles per year. Yew would be regenerated to preharvest or prescribed levels in timber sale units. Genetic reserve areas would be established whenever yew was harvested outside of timber sales.

This alternative emphasizes efficiency of yew sale preparation and entry into owl conservation areas to provide the highest level of harvest, with moderate protection of yew and the ecosystem in yew harvest areas.

B. The Environmentally Preferable Alternative

"The environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources." (Council on Environmental Quality, "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations" (40 CFR 1500-1508), Federal Register Vol 46, No. 55, 18026-18038, March 23, 1981; Question 6a.)

³ We are using "owl conservation areas" to include Forest Service Habitat Areas (HCAs), and BLM Old-Growth Emphasis Areas (OGEAs), Designated Conservation Areas (DCAs), Reserved Pair Areas, Managed Pair Areas, Residual Habitat Areas, Protected Habitat Areas (PHAs), and Protected Habitat Area Buffers (PHABs) as described in the BLM's draft resource management plans.

All the alternatives provide protection to the environment afforded by the standards and guidelines of the Forest Service regional guides and forest plans and BLM resource management plans (draft or final). Protection is also ensured by site-specific environmental analyses where adverse effects of yew harvest would be avoided or mitigated. Alternatives B, C, and D all limit the amount of yew harvest to a relatively low level. They also provide a high level of protection to Pacific yew and related forest resources. The combination of low harvest and high protection results in alternatives that have a low environmental impact.

However, Alternative B is the environmentally preferable alternative. The least amount of human-caused change to the biological and physical environment occurs with Alternative B. It has the least potential impact on historic and current cultural uses of Pacific yew for Native Americans and other users. And it gives the greatest amount of protection to the biological and physical environment, while still allowing some Pacific yew from federal lands to be made available for taxol research, development, and commercial use for treatment of cancer.

IV. Reasons for Selecting Alternative B

We considered a number of factors while weighing the merits of each alternative, including significant issues raised during the analysis, the public response to the DEIS, and the current and projected demand for Pacific yew for taxol from federal lands.

A. Response to Major Issues

Protect and Maintain Pacific Yew

The impacts on Pacific yew are quite minor for Alternatives B, C, and D, compared to minor to moderate impacts for Alternatives A, F, G1, and G2. Alternative B has the least impact on the survival and function of Pacific yew in federal forests mainly because Alternative B allows for harvest of the fewest yew trees of all alternatives, except for Alternative A. While Alternative A does not allow any yew to be harvested, it also does not provide for regeneration of the yew or protect it during timber harvest or site-preparation, resulting in a greater potential impact to the species than Alternative B.

In Alternative B, harvest of Pacific yew would be restricted to timber sale units and areas where it would otherwise be destroyed. Alternative B, in combination with mitigation measures, requires that yew be regenerated to pre-harvest or prescribed levels following timber harvest. Yew outside of timber sale units and other clearings would not be harvested, thus eliminating impacts to the reproductive capability and genetic diversity of the vast majority of yew on National Forest System and BLM administered lands.

Protect the Ecosystem

The impacts on the ecosystem are very small for Alternatives A, B, and C, compared to moderate to high impacts for Alternatives D, F, G1, and G2. Alternatives F, G1, and G2 present higher risks to threatened and endangered species and other wildlife. Of all the action alternatives, Alternative B has the lowest effect to the various parts of the ecosystem, due mainly to harvesting yew on the fewest acres (78,000 to 118,000 acres for Alternative B compared to 1,470,000 to 2,200,000 acres for Alternatives C through G1, and 2,310,000 to 3,470,000 acres for Alternative G2).

Measures for protecting the ecosystem are included in Alternative B as well as the mitigation measures, which were designed to ensure, among other things, that yew harvesting does not impair ecosystem functioning.

Provide Pacific Yew for Taxol

Alternative B will allow yew harvest in timber sale units and other clearings where it would otherwise be destroyed - 78,000 to 118,000 acres - over the next five years. This number of acres will yield an estimated 52,000 to 78,000 yew trees each year for five years, which in turn will yield 258,000 to 386,000 pounds of dry bark and/or 686,000 to 1,030,000 pounds of dry needles per year. All other alternatives, except Alternative A, provide for higher levels of yew harvest than Alternative B. The amount of bark available under Alternative B is about half of that which was provided to BMS each year by the Forest Service and BLM in 1991 and 1992 and about twice the amount projected to be harvested from National Forest System and BLM administered lands in Oregon, Washington, Idaho, and Montana in FY 1993.

If the projected Forest Service and BLM timber sale programs are met (future reductions in the federal timber sale program are probable but unpredictable at this time), implementation of Alternative B on National Forest System and BLM lands will provide enough taxol to treat over 8,250 cancer patients per year for five years. According to BMS, other sources of taxol (from private lands, from semi-synthesis, from other biomass) are expected to provide enough taxol to treat all additional patients in the US for which taxol might be prescribed (DeFuria, personal communication).

B. Other Decision Factors

In addition to considering how the alternatives responded to the major issues and concerns, we also considered the public response to the DEIS and the current and future demand for Pacific yew from National Forest System and BLM administered lands.

Public Response to the DEIS

The following are the major comments to the draft EIS (in italics), followed by our response to each comment.

Select a different preferred alternative; Alternative G1 has too great an impact on the Pacific yew and environment; Alternative B is the most reasonable alternative: Selection of Alternative B responds favorably to public concerns about choice of alternative.

Restate the DEIS purpose and need; consider new alternatives; prepare a supplement to the DEIS: The purpose of the proposed action, to make yew available from federal lands while sustaining yew and minimizing impacts to the ecosystem, remains essentially unchanged. The level of demand for taxol from Pacific yew from federal lands is currently uncertain and may fluctuate in the future. But, we found that the range of alternatives and the existing analysis gave us sufficient choice for the selection of an alternative (Alternative B) that is appropriate given the demand and the availability of other sources of taxol.

Provide for Sustained Yield of Yew: The Forest Service and BLM agreed to provide the NCI, and their pharmaceutical partner, Bristol-Myers Squibb, with material for taxol for a short time period of not more than five years until other sources of taxol became available. Because of the short time frame, all the action alternatives in the EIS explored short-term, uneven-flow harvest regimes rather than long-term, even-flow regimes.

Sustained yield of forest products is defined as the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources, without impairment of the productivity of the land (Multiple-Use Sustained Yield Act of 1960). Most people think of sustained yield as output of equal amounts of product each year throughout a cycle of

growth (rotation), but it can also be output of a large amount for a few years and then no output for the remaining years of the cycle. Although all the alternatives allow for sustained yield of Pacific yew, the selection of Alternative B allows for more options in future rotations due to having the largest residual (unharvested) population of yew remaining after five years.

Create a Needle Harvest Alternative: Six of the seven alternatives considered and analyzed in the FEIS allow for collection of needles in addition to, or instead of, harvesting the tree for its bark. If a need develops for needles, the selected alternative allows for that kind of collection.

Protect and Maintain Pacific Yew: See response to main issues.

Protect the Ecosystem: See response to main issues.

Provide Pacific Yew for Taxol: See response to main issues.

Current and Future Demand

To date, NCI and Bristol-Myers Squibb have been the only parties that have requested and obtained significant amounts of yew from federal lands (over 1.8 million dry pounds over the last five years). With the development of other sources of taxol, BMS will no longer be dependent on yew from federal lands and most likely will not be requesting it after 1993. In the last two years several companies and individuals have requested small amounts of federal yew (less than 10,000 pounds) for the purposes of taxol research or development. Future demand from these and other parties for Pacific yew from National Forest System and BLM administered lands is unknown.

Given this current demand situation, we expect that the amount of Pacific yew projected to be available under all the alternatives (except Alternative A that provides no yew), will be adequate to fulfill any requests from parties conducting taxol research and development. Alternative B, however, makes available the most reasonable amount in light of the relatively small foreseeable demand.

In summary, Alternative B allows for utilization of yew which might otherwise be destroyed in timber harvest and other activities; it provides a high degree of protection to the Pacific yew species; it has minimal impact on the ecosystem as a whole; it responds to public concerns; and it allows the agencies to respond to future requests for yew for cancer research and treatment should they arise.

V. Mitigation Measures

The mitigation measures in the FEIS were developed using "An Interim Guide to the Conservation and Management of Pacific Yew, as revised April 1993"³ as well as suggestions from the public. They were designed to protect the yew and the ecosystem. All practical means to avoid or minimize environmental harm from the selected alternative have been adopted. The mitigation measures for Alternative B follow. These apply only to areas where yew is harvested for taxol.

- If a timber sale is planned in a unique area where the only yew in the drainage is located in the sale area, then mitigation is required to assure the protection of this yew population. The purpose for this would be to protect the genetic importance of this unique population from timber sale unit locations.
- Consider including vigorous, undamaged yew trees or shrubs in the green tree reserves whenever possible.
- Harvest yew only where practical (i.e. sufficient number of stems of utilizable size).
- Where yew harvest is planned, harvest yew in the sale unit prior to the harvest of other tree species, to the extent that timber harvesters' health and safety will not be jeopardized. Preharvesting may be accomplished by decking yew logs in specific locations within the sale unit during logging operations.
- Harvest yew that is not in the residual green tree reserve.

³U.S. Department of Agriculture, Forest Service, 1992. An Interim Guide to the Conservation and Management of the Pacific Yew. Pacific Northwest Region. 78 p.

- Do not harvest yew for the primary purpose of yew products within 75 feet slope distance from the average high-water level of a perennial stream. Where forest plans, resource management plans, or other plans or prescriptions set wider streamside buffers, these greater buffers will be adhered to.
- Site-specific prescriptions will identify logging systems, site preparation and fuels reduction treatments, and conifer regeneration plans with regard to yew survival and regeneration.
- Use one or more of the following methods to maintain or replace yew on the site at pre-harvest levels. Where pre-harvest yew densities are estimated to be greater than 50 yew plants per acre, then a minimum of 50 yew plants per acre will be prescribed in site-specific prescriptions.
 1. Retain and protect as much of the residual yew (stumps, trees, shrubs, advanced regeneration remaining after harvest) as possible and practical from post-harvest activities such as slash piling and burning. Plan logging systems and slash disposal methods which favor the survival of residual yew plants and stumps, e.g., grapple piling or combined machine and burning methods or special burn prescriptions. Include retention of yew and yew stumps as one of the prescribed fire objectives in burning plans. Leave litter and down wood in those patches for seedling establishment.

Protect yew stumps by the following:

- a. To facilitate sprouting, leave yew tree stumps at the scientifically recommended height (currently 12" high). Yew shrubs should be cut to leave a similar length from the root collar.
- b. Leave bark intact on yew stumps.
- c. Whenever possible and practical, shade yew stumps with slash or adjacent vegetation and position reserve green trees to provide shade for yew stumps and advanced yew regeneration. Shading is not normally necessary on shrub form yew; site-specific analysis may help determine how much shading is needed.

2. Encourage natural regeneration (from seed already present on site) by using any site preparation methods known to favor yew seed germination and establishment. Site-specific prescriptions will provide seed sources and desired site conditions for natural regeneration of yew and protect concentrations of existing yew where feasible, while still meeting other management objectives. Where on-the-ground conditions preclude this, planting of yew will be prescribed.
 3. Plant seedlings according to site-specific prescriptions if prescribed regeneration of yew has not been achieved and there is assurance that regeneration by other means is not occurring. Obtain rooted cuttings or seed or seedlings from sources within the local management area. Cuttings could be collected before harvest. Animal protection measures need to be considered where browsing of young yew is predicted. Refer to "An Interim Guide to the Conservation and Management of Pacific Yew," page 27, for transfer of genetic material guidelines.
- *Monitoring:* Where possible, monitor yew regeneration in conjunction with normal regeneration and other area surveys.
 - *Endangered Species Act Consultation:* Yew harvest will be conducted in accordance with all conditions, restrictions, and monitoring procedures that are developed during project level Section 7 consultation required by the Endangered Species Act.
 - *Seasonal Restrictions for Listed Species:* Pacific yew harvest will follow the appropriate seasonal restrictions for the affected listed species indicated during the project level (site-specific) Section 7 consultation required by the Endangered Species Act.
 - *Utilization of Yew Material:* Follow current Forest Service and BLM policies for utilization of yew wood, bark, and needles. These policies may differ between Forest Service regions or national forests or between BLM districts.

- *Transfer of Yew, Administration of Permits, and Theft Prevention:* Follow current Forest Service and BLM policies for transfer of yew, administration of permits, and theft prevention.
- *Tribal Treaties:* Comply with all Native American tribal treaties and consult with tribes where yew harvest may impact trust lands.

VI. Monitoring

Monitoring yew harvest, yew survival and regeneration, and protection of other resources will be guided by Forest Service and BLM harvest policies and requirements in forest plans and resource management plans, as well as monitoring identified in site-specific analyses. The FEIS requires that yew regeneration be monitored in conjunction with other conifer regeneration surveys (Appendix B-1 in FEIS).

VII. Findings Required by Other Laws

Pacific Yew Act: Under Section 3 of the Act, the Secretaries of the Departments of Agriculture and Interior are required to “pursue a conservation and management policy” to provide for sustainable harvest and long-term conservation of Pacific yew. The decision in this Record of Decision satisfies Section 3 of the Pacific Yew Act.

National Forest Management Act (NFMA): Implementation of Alternative B at the project level (site-specific) will be consistent with Forest Service forest plans which, in turn, conform to requirements of NFMA.

Federal Land Policy and Management Act (FLPMA): Implementation of Alternative B at the project level (site-specific) will be consistent with BLM resource management plans (or both existing management framework plans and draft or proposed RMPs where RMPs are not complete) which, in turn, conform to requirements of FLPMA.

Consultation Required by the Endangered Species Act: The U.S. Fish and Wildlife Service and the National Marine Fisheries

Service concur with our determination that implementation of Alternative B may affect, but is not likely to adversely affect, listed species. Because this decision does not authorize any site-specific activities, the impact from harvest of yew in a timber sale unit on threatened and endangered species will be evaluated through consultation on a project-level basis when site-specific information is available.

Review by the Environmental Protection Agency: The Environmental Protection Agency (EPA) reviewed the Draft Environmental Impact Statement and they found "no significant statutory or jurisdictional issues." They rated the DEIS "LO" (Lack of Objections).

VIII. Implementation Date

Forest Service: This decision may be implemented 30 days after the date that the Environmental Protection Agency's Notice of Availability of the Final EIS appears in the Federal Register. All project-level decisions made after this date will be consistent with the FEIS and ROD.

Bureau of Land Management: This decision may be implemented 30 days after the date that the Environmental Protection Agency's Notice of Availability of the Final EIS appears in the Federal Register. In the event that a timely petition for stay is filed, this decision may be implemented 45 days after expiration of the 30-day appeal period unless the Director of the Office of Hearings and Appeals or an Appeals Board has determined otherwise in accordance with 43 CFR 4.21(b) (58 FR 4939, January 19, 1993). All project-level decisions made after the implementation date will be consistent with the FEIS and ROD.

IX. Administrative Appeal Procedures

Forest Service: This decision is subject to appeal pursuant to 36 CFR 217 (as amended). A written Notice of Appeal must be submitted in duplicate to the reviewing officer:

F. Dale Robertson
Chief, Forest Service
US Department of Agriculture
South Bldg., 12th and Independence Avenue, S.W.
PO Box 9690
Washington, DC 20090-6090

The notice of appeal must include sufficient narrative evidence and argument to show why this decision should be changed or reversed (36 CFR 217.9). The notice of appeal must be filed within 90 days of the date of initial publication in the Oregonian.

Bureau of Land Management: This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR, Part 4 . If an appeal is taken, your notice of appeal must be filed at the following office within 30 days from the publication by the Environmental Protection Agency in the Federal Register of the Notice of Availability of the Final EIS and Record of Decision:

State Director
BLM Pacific Yew Program Lead
Oregon/Washington State Office
USDI Bureau of Land Management
PO Box 2965
Portland, OR 97208

and a copy to:

Office of the Solicitor
US Department of Interior
1849 C Street, N.W.
Washington, D.C. 20240-9998

The appellant has the burden of showing that the decision being appealed is in error. If you choose to file a petition (pursuant to regulation 43 CFR 4.21 [58 FR 4939, January 19, 1993]) for a stay (suspension) of the implementation of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay **must accompany** your notice of appeal. A petition for stay is required to show sufficient justification based on the standards listed below. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted. Copies of the notice of appeal and justification for a stay **must also** be submitted to:

US Department of the Interior
Office of the Secretary
Board of Land Appeals
1849 C Street, N.W.
Washington, D.C. 20240-9998

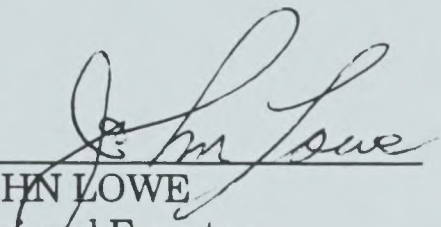
at the same time the original documents are filed with the office of the Oregon/Washington State Director, USDI Bureau of Land Management and the USDI Office of the Solicitor (see 43 CFR 4.413).

Standards for Obtaining a Stay (for BLM only)

Except as otherwise provided by law or other pertinent regulation, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards:

1. The relative harm to the parties if the stay is granted or denied,
2. The likelihood of the appellant's success on the merits,
3. The likelihood of immediate and irreparable harm if the stay is not granted, and
4. Whether the public interest favors granting the stay.

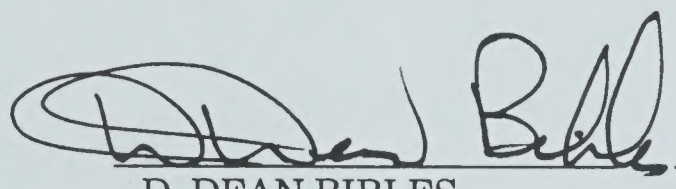
X. Signatures and Date



JOHN LOWE
Regional Forester
Pacific Northwest Region
USDA Forest Service

SEP 08 1993

Date



D. DEAN BIBLES
State Director
Oregon and Washington State Office
USDI Bureau of Land Management

SEP 08 1993

Date



